



Challenges in Determining the Cause of Death in a Drowned Decomposed Body: A Case Report

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Abstract

Background: Determining the cause of death in decomposed bodies recovered from water is one of the more challenging tasks in forensic pathology. Advanced putrefaction can obscure or modify the classical findings of drowning, making it difficult to distinguish decomposition-related changes from features that support antemortem immersion. In such situations, establishing the cause of death depends on careful interpretation of autopsy findings together with investigative information.

Case Presentation: A 40-year-old male, reported missing for several days, was recovered from a well in an advanced stage of decomposition. At autopsy, the brain, heart, liver, and kidneys showed marked putrefactive changes characterized by softening, discoloration, and tissue friability. Both lungs were enlarged and oedematous, with abundant frothy fluid present within the airways and on the cut surface. No fatal traumatic injuries or significant gross pathological lesions capable of explaining death were identified.

Discussion: Although decomposition had affected most internal organs, the pulmonary findings remained supportive of drowning. Correlation of these observations with the recovery circumstances and exclusion of alternative causes of death allowed a reasoned forensic opinion despite the limitations imposed by decomposition. This case highlights the importance of interpreting individual autopsy findings within the overall medicolegal context rather than relying on any single feature.

Conclusion: Examination of decomposed bodies recovered from water requires a systematic and multidisciplinary approach. Careful integration of scene investigation, autopsy findings, and ancillary evidence is essential for reaching a reliable opinion on the cause of death when classical features of drowning have been altered by putrefaction.

Keywords: Drowning; Decomposition; Putrefaction; Forensic pathology; Cause of death; Autopsy; Medicolegal investigation.

INTRODUCTION

Drowning is one of the leading causes of accidental death worldwide and remains an important challenge in forensic practice. In India, where numerous natural and artificial water bodies are present, deaths due to drowning are frequently encountered during medicolegal investigations. While the diagnosis may be relatively straightforward in freshly recovered bodies, it becomes considerably more difficult when recovery is delayed and decomposition has progressed. Postmortem decomposition can alter or obscure many of the classical findings associated with drowning. Progressive autolysis and putrefaction produce changes such as softening of internal organs, tissue friability, discoloration, and loss of normal anatomical architecture. These alterations may overlap with or mask findings that are traditionally regarded as supportive of drowning, making interpretation of autopsy findings increasingly challenging. Consequently, reliance on a single postmortem feature is neither appropriate nor scientifically reliable.

The diagnosis of antemortem drowning is therefore established through a comprehensive evaluation of all available evidence. Information obtained from the scene of recovery, police investigation, external examination, internal autopsy findings, and ancillary investigations should be interpreted collectively. Supportive findings, including enlarged oedematous lungs and persistent frothy fluid within the airways, gain greater significance only when considered alongside the circumstances of the case and after excluding other potential causes of death.

The present case involves a decomposed body recovered from a well, where advanced putrefactive changes affected several internal organs and complicated the postmortem examination. Despite these challenges, careful correlation of the investigative history with the autopsy findings allowed a reasonable forensic opinion regarding the cause of death. This case highlights the importance of adopting a systematic and evidence-based approach when examining decomposed bodies recovered from water and underscores the limitations of relying solely on classical drowning features in advanced decomposition.

CASE REPORT

Case 1

As per alleged history, the deceased was missing since 14/06/2026. Missing person report was lodged on 16/06/2026. On 18/06/2026, the body of the deceased was found floating in a well. The body was retrieved from the well and subsequently brought to the mortuary of Maulana Azad Medical College, New Delhi for postmortem examination on 19/06/2026.

Autopsy Findings: The brain was pale, softened, and friable, consistent with advanced decomposition changes. Both lungs were voluminous, enlarged, and oedematous, with abundant frothy fluid present within the airways and on the cut surface, suggestive of drowning. The heart showed marked decomposition changes with softening of the myocardium, without any gross evidence of traumatic injury. The liver was decomposed, exhibiting greenish discoloration, marked softening, and friability of the hepatic parenchyma. Both kidneys demonstrated decomposition changes with softening and discoloration, and the corticomedullary junction was indistinct due to putrefaction.

Table 1: Demographic and Case Summary.

Parameter	Findings
Age	40 years
Sex	Male
Nature of Case	Body recovered from water in a decomposed state
Stage of Decomposition	Advanced decomposition
Circumstances	Suspected drowning
Cause of Death	Asphyxia due to antemortem drowning

Table 2: Major Autopsy Findings.

Organ	Autopsy Findings
Brain	Pale, softened, and friable, consistent with decomposition changes
Lungs	Voluminous, enlarged, oedematous, with abundant frothy fluid present
Heart	Decomposition changes with softening of the myocardium
Liver	Greenish discoloration with marked softening and friability of the hepatic parenchyma
Kidneys	Softening and discoloration with loss of corticomedullary junction due to putrefaction
Final Opinion	Findings, in correlation with investigative history, were consistent with asphyxia due to antemortem drowning

Table 3. Forensic Interpretation of Autopsy Findings.

Finding	Interpretation
Voluminous oedematous lungs	Supportive finding of drowning
Frothy fluid in airways	Classical supportive feature of antemortem drowning
Softened brain	Decomposition-related change
Softened myocardium	Putrefactive change; not indicative of primary cardiac pathology
Greenish, friable liver	Advanced putrefaction
Loss of corticomedullary junction in kidneys	Decomposition-related autolysis
Absence of fatal injuries	Supports exclusion of traumatic cause of death
Correlation with scene findings	Essential for establishing drowning as the cause of death

DISCUSSION

The present case highlights the diagnostic challenges encountered in determining the cause of death in decomposed bodies recovered from water. Drowning remains one of the leading causes of accidental death worldwide; however, when

recovery of the body is delayed, putrefactive changes may obscure or mimic the classical autopsy findings of drowning. Consequently, establishing the cause of death requires careful integration of scene investigation, autopsy findings, and exclusion of alternative causes of death.

Overlap Between Decomposition and Drowning Findings

Decomposition produces progressive softening, discoloration, and friability of internal organs, making interpretation of postmortem findings difficult. In the present case, the brain, myocardium, liver, and kidneys exhibited advanced putrefactive changes, including softening, discoloration, and loss of normal tissue architecture. Such changes are expected in decomposed bodies and are not specific for drowning. The challenge for the forensic pathologist is to distinguish these nonspecific decomposition changes from genuine antemortem pathological processes.

Pulmonary Findings and Their Forensic Significance

Despite advanced decomposition, both lungs were markedly voluminous, enlarged, and oedematous, with abundant frothy fluid within the airways. These findings are among the classical autopsy features supporting drowning, although none is individually pathognomonic. Pulmonary oedema and froth may diminish or disappear as decomposition advances; therefore, when present in conjunction with appropriate investigative findings, they provide important supportive evidence of antemortem drowning. The persistence of these pulmonary findings in the present case strengthened the diagnosis despite extensive putrefaction.

Importance of Comprehensive Medicolegal Investigation

No fatal traumatic injuries or other gross pathological conditions capable of causing death were identified during the autopsy. In such cases, determination of the cause of death should never rely solely on internal organ findings. Information regarding the circumstances of recovery, scene examination, police investigation, and complete autopsy findings must be carefully correlated before certifying drowning as the cause of death. This multidisciplinary approach minimizes diagnostic error and improves the accuracy of medicolegal opinions.

Role of Histopathology and Ancillary Investigations

Advanced decomposition often limits the diagnostic value of histopathological examination because autolysis distorts the normal microscopic architecture of tissues. In such situations, ancillary investigations such as toxicological analysis, diatom examination (where appropriate), and postmortem imaging may provide additional information to help exclude other possible causes of death. However, none of these investigations alone can confirm drowning. Instead, the final opinion should be based on careful correlation of the autopsy findings with the circumstances of recovery, scene investigation, and other available evidence.

Medicolegal Implications

Determining the cause of death in decomposed bodies recovered from water has important medicolegal implications. Establishing whether death resulted from antemortem drowning or whether the body was disposed of in water following death directly influences the manner of death and the course of legal investigation. Therefore, forensic pathologists must adopt a systematic and evidence-based approach, recognizing the limitations imposed by decomposition while carefully interpreting all available findings before certifying the cause of death.

CONCLUSION

This case demonstrates the significant challenges in diagnosing drowning in a decomposed body because many postmortem changes overlap with the classical features of drowning. Advanced putrefaction resulted in marked softening and discoloration of multiple organs, whereas the presence of voluminous oedematous lungs with persistent frothy fluid, together with the investigative findings and exclusion of other fatal injuries or diseases, supported the diagnosis of asphyxia due to antemortem drowning.

The case emphasizes that no single autopsy finding is diagnostic of drowning, particularly in decomposed bodies. Accurate cause-of-death determination requires meticulous autopsy examination, careful interpretation of decomposition-related changes, correlation with scene and investigative findings, and appropriate ancillary investigations whenever possible. A structured multidisciplinary approach remains essential for reliable medicolegal opinion and accurate cause-of-death certification in challenging drowning cases.

DECLARATIONS

Ethics Approval: All cases were medico-legal autopsies conducted under statutory obligation. Patient identifiers have been anonymised. Institutional ethical exemption applicable under ICMR National Ethical Guidelines for Biomedical and Health Research (2017), Chapter 6 (Exemption from Ethical Review).

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Conflict of Interest: The authors declare no conflict of interest.

Data Availability: All data are available within the manuscript. Individual case records are available from the corresponding author upon reasonable request.

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